THE ROLE OF GOLD AS A DIVERSIFIER, HEDGE AND SAFE HAVEN: A STUDY ON THE IMPACT OF STOCK MARKET AND INFLATION IN MALAYSIA

MOHD FAHMI BIN GHAZALI

UNIVERSITI SAINS MALAYSIA

2016

THE ROLE OF GOLD AS A DIVERSIFIER, HEDGE AND SAFE HAVEN: A STUDY ON THE IMPACT OF STOCK MARKET AND INFLATION IN MALAYSIA

by

MOHD FAHMI BIN GHAZALI

Thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

May 2016

ACKNOWLEDGEMENT

The completion of any thesis, undoubtedly, largely depends on the hard work and endurance of a researcher. This thesis is no exception. Nevertheless, without assistance and support from various people and organisations, it could not have been possible to produce this thesis. Therefore, I would like to take this opportune moment to acknowledge the support received from such people and organisations.

Firstly, I would like to express my special appreciation and sincere gratitude to my two supervisors, Professor Dr Lean Hooi Hooi and Associate Professor Dr Zakaria Bahari for their unparalleled support. Their patience, encouragement and valuable guidance from the initial to the final stages, were the key motivations throughout my doctoral journey. Without their supervision, this thesis would not have been possible. I remain thankful and grateful.

Besides, I would like to thank the rest of the academic and non-academic staff at the School of Social Sciences, particularly my thesis monitoring committees: Dr Jacqueline Fernandez, Associate Professor Dr Chua Soo Yean, Associate Professor Dr Abdul Fatah Che Hamat and Professor Dr Suresh Narayanan, for their insightful comments and constructive suggestions that significantly improved the thesis and widened my research from various perspectives.

I recognise that this thesis would not have been possible without constant support from various institutions and agency. Thus, the acknowledgement is also extended to my employer, Universiti Malaysia Sabah and the Ministry of Higher Education Malaysia for the study leave, scholarship and research grant, as well as Universiti Sains Malaysia for the financial support in attending several conferences.

I would be remiss if I did not devote a little space to thanking my fellow graduate students (Jasman Tuyon and Hylmee Matahir) and colleague (Rizal Hamid) who believed in me and spurred my spirits to all challenges during my study.

I must not forget to show my sincere appreciation to my family members, most especially, my parents and to my brothers and sisters for the support they provided me through my entire life. Words cannot adequately describe how grateful and indebted I am to my late father, Ghazali bin Siraj, who passed away while the thesis writing was in progress (may his soul rest in peace). He has sacrificed so much for us and set me on the path I am on now. Without him, I would not be the person I am today. The same is extended to my beloved mother, Badariah binti Dahlan for all of the sacrifices that she has made on my behalf. Your prayer for me is what sustained me thus far. Last but not the least, my deepest appreciation to my wife, Naida binti Nganro and my daughter, Nur Hannah Nahidah for their everlasting love, unwavering belief and spiritual support every single minute throughout the writing of this thesis.

To the people as mentioned above and to those who have not been mentioned, your sacrifice and encouragement are greatly appreciated and will always be in my memory.

TABLE OF CONTENTS

Page

CHAPTER 3 - DATA AND METHODOLOGY

CHAPTER 4 - EMPIRICAL RESULTS (SAMPLE PERIOD 2001-2014)

CHAPTER 5 - EMPIRICAL RESULTS (SAMPLE PERIOD 2010-2014)

CHAPTER 6 - CONCLUSION

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AIG	American International Group
APGARCH	Asymmetric power GARCH
APT	Arbitrage pricing theory
AR	Autoregressive
ARCH	Autoregressive conditional heteroscedasticity
ARDL	Autoregressive distributed lag
ARIMA	Autoregressive integrated moving average
ARMA	Autoregressive moving average
ASEAN	Association of Southeast Asian Nations
BB REITs	Bloomberg Real Estate Investment Trust Index
BRICs	Brazil, Russia, India and China
CAPM	Capital asset pricing model
COMEX	Commodity Exchange
CPI	Consumer price index
DARA	Decreasing absolute risk-averse
EAFE	Europe, Australasia, Far East
ECA	Exchange Control Act 1953
ETFs	Exchange-traded funds
EU	European Union
Euribor	European Interbank Offered Rate
FED	Federal Reserve
FTSE	Financial Times-Stock Exchange
GA-i	Gold Account-i

LIST OF ABBREVIATIONS

GARCH	Generalized autoregressive conditional heteroscedasticity
GDA	Gold Deposit Account
GDP	Gross domestic product
GIA	Gold Investment Account
GNP	Gross national product
GSA	Gold Savings Account
GST	Goods and services tax
GSCI	S&P Goldman Sachs Commodity Index
GSPA	Gold Savings Passbook Account
i.i.d.	Independent and identically distributed
IFS	International Financial Statistics
IMF	International Monetary Fund
IPI	Industrial production index
KE	*Kijang Emas*
KFH	Kuwait Finance House
KFHMB	Kuwait Finance House (Malaysia) Berhad
KLCI	Kuala Lumpur Composite Index
LBM	London Bullion Market
LBMA	London Bullion Market Association
LM	Lagrange multiplier
MA	Moving average
MAE	Mean absolute error
MMS	Money Market Services

LIST OF ABBREVIATIONS

MPT	Modern portfolio theory
MSCI EM	Morgan Stanley Capital International Emerging Market
NPLs	Non-performing loans
NSE NIFTY	National Stock Exchange Fifty
OLS	Ordinary least square
PCi Gold	Premium Currency Investment Gold
PIIGS	Portugal, Italy, Ireland, Greece, Spain
RMSE	Root mean square error
S&P 500	Standard & Poor's 500
SBF	Société des Bourses Françaises
SML	Security market line
SPMI	Spot Precious Metal Index
TGARCH	Threshold GARCH
TIPS	Treasury Inflation Protected Securities
UK	United Kingdom
US	United States
VAR	Vector autoregressive
VECH	Half-vector
VECM	Vector error correction model
WPI	Wholesale price index

PERANAN EMAS SEBAGAI PEMPELBAGAIAN, LINDUNG NILAI DAN PERLINDUNGAN SELAMAT: KAJIAN KE ATAS KESAN PASARAN SAHAM DAN INFLASI DI MALAYSIA

ABSTRAK

Walaupun kesepakatan sejagat mengatakan emas sebagai aset perlindungan yang selamat, penyelidikan akademik empirik mengenai topik ini setakat ini adalah agak jarang, terutamanya dalam konteks Malaysia. Oleh itu, tujuan utama kajian ini adalah untuk menganalisa ciri-ciri emas, sama ada ia bertindak sebagai pempelbagaian, lindung nilai atau perlindungan selamat terhadap saham; dan juga sebagai lindung nilai atau perlindungan selamat terhadap inflasi; semasa iklim ekonomi yang berbeza. Berdasarkan hubungan konstan, kajian ini menunjukkan bahawa emas, secara umumnya, memaparkan sedikit bukti ciri lindung nilai yang kuat terhadap pasaran saham dalam sampel penuh (2001-2014). Namun begitu, kajian ini mendokumenkan beberapa peranan pelindungan nilai yang kuat bagi emas tempatan dalam sampel yang lebih pendek (2010-2014), tempoh apabila perhatian khusus diberikan kepada krisis hutang Eropah. Emas antarabangsa, di sisi lain, kurang bermampuan untuk bertindak sebagai pelindung nilai dalam tempoh yang sama (2010-2014). Berhubung dengan ciri perlindungan selamat, hubungan kuantil menunjukkan bahawa emas tempatan, pada keadaan terbaik, cenderung untuk menjadi perlindungan selamat yang lemah terhadap pasaran saham di kedua-dua tempoh masa. Walau bagaimanapun, emas antarabangsa, terutamanya emas dalam denominasi pound UK,

boleh bertindak sebagai perlindungan selamat yang kuat semasa pergerakan melampau dalam pulangan saham. Kekuatan ciri perlindungan selamat berbeza-beza mengikut keadaan pasaran dan frekuensi pulangan. Berkenaan dengan hubungan emas-inflasi, tesis ini mendapati bahawa emas, pada keadaan terbaik, adalah instrumen pelindungan nilai dan perlindungan selamat yang kurang berdaya maju terhadap inflasi. Tesis ini juga mendapati bahawa denominasi mata wang yang berbeza, frekuensi kejutan yang berbeza dan jenis emas yang berbeza adalah penting dalam menentukan kesan lindung nilai dan perlindungan selamat manakala emas dalam pelbagai berat hanya memainkan peranan kecil. Kesimpulannya, dapatan-dapatan ini menunjukkan bahawa emas memainkan peranan yang kecil semasa kemerosotan pasaran saham dan episod inflasi di Malaysia. Oleh itu, memegang portfolio yang pelbagai dapat membantu dalam memberikan pulangan yang munasabah dan perlindungan daripada keruntuhan ekonomi.

THE ROLE OF GOLD AS A DIVERSIFIER, HEDGE AND SAFE HAVEN: A STUDY ON THE IMPACT OF STOCK MARKET AND INFLATION IN MALAYSIA

ABSTRACT

Despite the universal agreement of gold as a safe haven asset, empirical research on this issue to date is relatively sparse, particularly in the context of Malaysia. Therefore, this study primarily aims to analyse the characteristics of gold, whether it acts as a diversifier, a hedge or a safe haven against stock; and as a hedge or a safe haven against inflation; during various economic climates. Based on the constant relations, this study demonstrates that gold, generally, displays little evidence of the strong hedge property against the stock market in the full sample (2001-2014). Nevertheless, this study documents some strong hedging role for local gold in the shorter sample (2010-2014), the period when special attention is given to the European debt crisis. International gold, on the other hand, performs poorly as a hedge during the same period (2010-2014). In terms of the safe haven feature, the quantile relations show that local gold, at best, tends to be a weak safe haven against the stock market in both periods. However, international gold, in particular gold denominated in the UK pound, can act as a strong safe haven during extreme movements in stock return. The strength of the safe haven characteristic varies across market conditions and return frequencies. Concerning gold-inflation relationships, this study reveals that gold, at best, is a less viable hedging and safe haven instruments against inflation. This study

also finds that different currency denominations, different frequencies of shock and different types of gold are important in determining the hedge and safe haven effects while gold in various weights only play a minor role. In conclusion, these results demonstrate that gold plays only a minor role during stock market slumps and inflationary episodes in Malaysia. Therefore, holding a well-diversified portfolio could potentially provide reasonable return and protection from economic collapse.

CHAPTER 1

INTRODUCTION

1.1 Introduction

During the past couple of years, the issue of gold has received a considerable amount of critical attention, since it is of great importance as an investment strategy. There have been debates by financial media to motivate investors to hold gold. Inter alia, gold can be included in a financial assets portfolio (i.e., stocks and bonds), since investors can acquire diversification benefits that stem from the less-than-perfect correlation of gold with these asset classes, and from better protection against inflation. The inclusion of gold in mixed-asset portfolios can potentially decrease a portfolio's systematic risk (for a given return), or raise that portfolio's return (for the same risk level) (Chua, Sick, & Woodward, 1990; Conover, Jensen, Johnson, & Mercer, 2009; Jaffe, 1989; McDonald & Solnick, 1977). On the subject of inflation, it has been alleged by many financial media that gold generally provides a positive hedge against inflation (Cai, Cheung, & Wong, 2001; Jastram & Leyland, 2009; Koutsoyiannis, 1983; Worthington & Pahlavani, 2007).

In various religious and cultural areas, gold represents royal and honourable features. It possesses a critical position among the class of major precious metals, and is even considered the leader of the precious metal pack. Increases in the price of gold tend to cause parallel movements in the prices of other precious metals, e.g., palladium, platinum and silver (Sari, Hammoudeh, & Soytas, 2010). It has represented the

ultimate standard of value in a large part of the world for many years, attributable to its divisibility and durability, among other valuable features. Not only that, it was a standard that held steady its purchasing power in terms of goods for a long time (Capie, Mills, & Wood, 2005).

Furthermore, in countries in which financial systems are in early stages of development, the range of investment opportunities may only be starting to grow, and confidence in financial markets and institutions may be less than full. Therefore, it remains of significant interest to investigate whether assets such as gold can be held outside the financial system, and maintain their original value in times of uncertainty (Starr & Tran, 2008).

The high prices of gold can be linked to "fear" trade; to wit, the price of gold rises due to investors' fears of the weak future of the stock market or overall economic performance. The latter may include higher expected inflation due to lax central bank policies, and purchases of gold motivated by "fear" occur anytime, but are unlikely to occur in the same month every year. Figure 1.1 shows that, since the turn of the century (the year 2000), until 2014, the international price of gold has shown dramatic growth (more precisely, 337.8%).

The performance of gold was more impressive given the losses suffered in other asset classes during the 2007-2008 financial crisis. In times of uncertainty, due to investors' unwillingness to trade, asset values become ambiguous. However, the trades on gold may increase due to the relative simplicity of the gold market (Dee, Li, & Zheng, 2013). Fears of a global economic recession caused stock markets to plummet

in October, 2008. As shown in Figure 1.2, since October, 2008, the price of gold has soared, indicating a positive response to the intensification of the financial crisis.[1] Therefore, since the start of the financial crisis triggered by poorly performing subprime mortgages and subsequent failures of large investment banks, investment funds on precious metals have significantly increased. This indicates that investments in gold are not only driven by inflation hedge consideration, as mentioned by Jensen, Johnson, and Mercer (2002), and Kat and Oomen (2007), but also by the consideration of tactical values in portfolio allocation. This situation is in sharp contrast to that of the 1990's, and to the time of the burst of the dot-com bubble (during which the opposite was the case), where investors were highly optimistic about the future of the stock market.

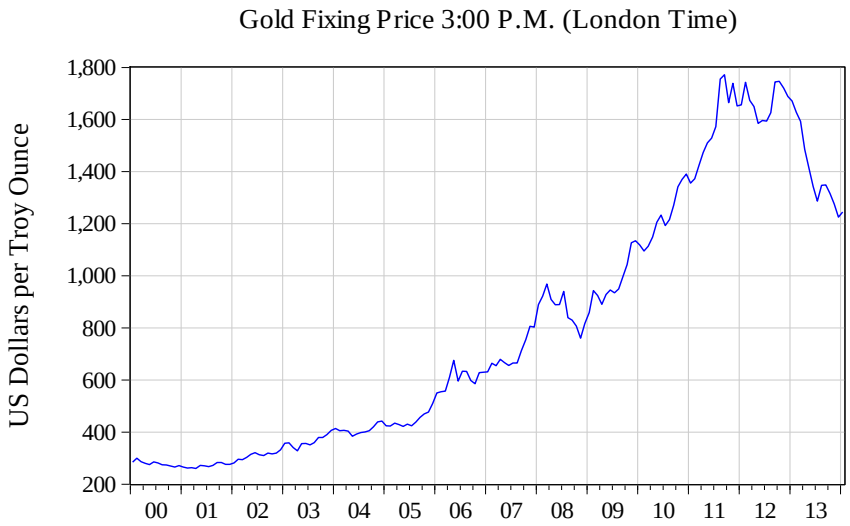

Figure 1.1: The Evolution of Gold Prices over a 15-Year Sample Period from January, 2000 until January, 2014 (Monthly Data).
Source: London Bullion Market Association (henceforth LBMA) homepage.

[1] The fear of high inflation in emerging economies such as the BRICs (Brazil, Russia, India and China) countries, and of monetary expansion (e.g., quantitative easing) in advanced countries, also accelerate the sharp increase in the price of gold (Miyazaki & Hamori, 2013).

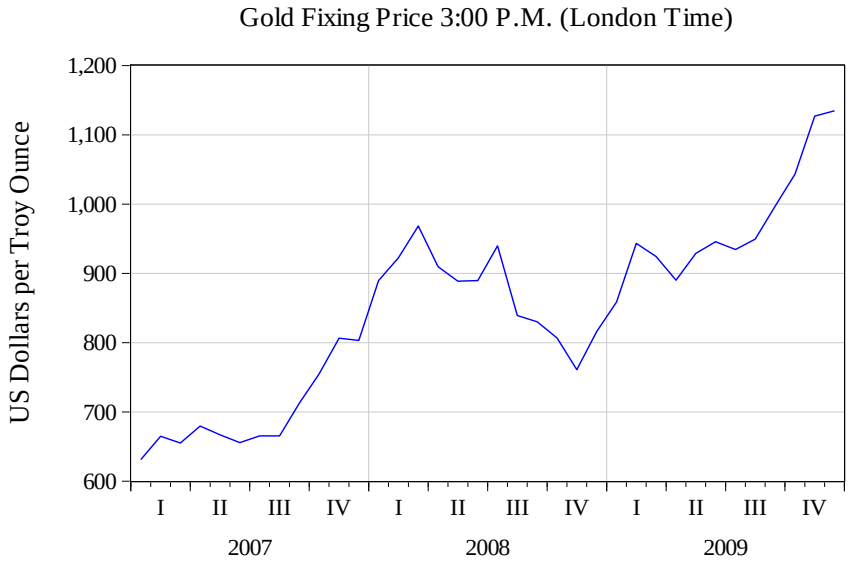

Figure 1.2: The Evolution of Gold Prices during the Global Financial Crisis in 2007-2009 (Monthly Data).
Source: LBMA homepage.

Although there exists substantial empirical evidence in developed markets regarding the connection between stock returns and gold returns from the portfolio diversification perspective (Chua et al., 1990; Hillier, Draper, & Faff, 2006; Jaffe, 1989; Sherman, 1982), research on gold as a safe haven investment has rarely been tested in the related literature, and remains unclear, particularly in using data quoted in a currency other than that of the United States (henceforth the US) and of the United Kingdom (henceforth the UK). Serious discussions and analyses on this issue have been presented by Baur and Lucey (2010), and Baur and McDermott (2010), where they take the concept of a discontinuous relation between gold and financial assets. They suggest that investors will seek out a safe haven in response to severe market shocks suffered over a short period. They also find evidence that the haven effect, in most cases, is only present in developed markets, and not in emerging markets. Losses in emerging markets, even if severe, do not induce international investor movement towards the safe haven asset. Nevertheless, these analyses do not take into account

safe haven characteristics of gold against the stock market during a decline in output growth, nor do they examine this issue during times of rising inflation.

On the issue of the relationship between gold and inflation, although several studies produce estimates of gold as an inflation hedge over the long-term perspective (e.g., Ghosh, Levin, Macmillan, & Wright, 2004; McCown & Zimmerman, 2006; Narayan, Narayan, & Zheng, 2010; Worthington & Pahlavani, 2007), only a few studies focus on the safe haven property of gold against inflation, particularly during times of extreme inflation. Adrangi, Chatrath, and Raffiee (2003) suggest that gold investments act as a safe haven during inflationary periods, but the expositions are unsatisfactory, since they fail to draw any structured research in sufficient detail. Beckmann and Czudaj (2013) analyse the question on whether gold provides the ability to hedge against inflation from a new perspective, by allowing for non-linearity, and discriminating between long-run and time-varying, short-run dynamics. However, their analysis was unable to detect haven characteristics of gold in times of turbulence and ambiguous patterns of inflation.

1.2 Background of the Study

Investors have recently read numerous headlines regarding the price of gold rising sharply and hitting high records due to the Eurozone and the US debt crises of July, 2011. Such news and uptrends in the price of gold are attracting more attention to its value as an investment.[2] This situation was in sharp contrast to that of the 1990's, when the opposite was the case, where investors were optimistic about the future of the stock

[2] From 1st January, 2000 to 31st December, 2009, the simple buy and hold return on gold in the London Bullion Market (henceforth LBM) was 276.63%, while investment in the S&P 500 Composite Index over the same period yields -24.1%.

market.[3] After the burst of the dot-com bubble, many investors invested in gold to hedge against stock market uncertainty and potential risk of inflation. O'Byrne (2007) listed several fundamental reasons for owning gold, including the US trade and current account deficits, deteriorating property values, geopolitical instability, the weak dollar, increased demand for haven assets,[4] and hedging against macroeconomic risk, among others.

Since the Great Depression, international financial markets have experienced a series of turbulences in different parts of the world. Among others are the Mexican crisis in 1994, the Asian financial crisis in 1997-1998,[5] the Russian crisis in 1998, the Brazilian crisis in 1999, the Argentine financial crisis in 2001-2002, the Icelandic financial crisis 2008-2009, and most recently, the financial crisis of 2007-2012, including the 2007 US subprime crisis and 2010 the European sovereign debt crisis.

The 2007-2012 economic crises set off by the US and the European Union (henceforth EU) have become a global phenomenon. Bank failures and fear over sovereign default, particularly in the Eurozone, forced investors to re-evaluate their models of risk. Events of a geopolitical nature in the Middle East and North Africa, and those of a geophysical nature in East Asia, have added to the sense of global uncertainty during the year of 2011. These crises have resulted in a drastic drop and

[3] From 1st January, 1990 to 31st December, 1999, the simple buy and hold return on gold in the LBM was -27.43%, while investment in the S&P 500 Composite Index over the same period yields 315.75%.
[4] In the past, gold has often been considered a safe haven during periods of economic and political instability, in which event rising demand would lead to increase in the price of gold (Adrangi et al., 2003).
[5] The 1997-1998 Asian crisis has brought the market index of Thailand to nosedive from a peak of 1410.33 points in January, 1996 to 214.53 in August, 1998. Other regional markets, particularly Malaysia, Indonesia, and the Philippines, plummeted as well. Their market indices plunged by more than half over roughly the same periods. These shocks were then spread to the real sector. The growth rates in Indonesia, Malaysia, the Philippines and Thailand in 1997 were 4.7%, 7.3%, 5.2% and -1.7%, respectively. In 1998, these figures dropped drastically for all countries to -13.1% (Indonesia), -7.4% (Malaysia), -0.6% (the Philippines) and -10.2% (Thailand).

excessive volatility in leading indicators such as stock markets[6] to crises-affected countries, bringing substantial costs as the shocks were translated into banking distress and economic slumps.

Moving in line with the collapse of the stock market was the gross domestic product (henceforth GDP), where this coincident indicator changed at approximately the same time as the change of the entire economy. Several theoretical propositions explain the role of stock prices as a leading indicator of economic growth, further strengthening the link in the relationship between these two variables: inter alia, (1) Tobin's Q, (2) the traditional valuation model of stock prices, (3) the working of the wealth effect, and (4) the financial accelerator.

The first link, proposed by Tobin (1969), emphasises the impact of share prices on the cost of capital, and is captured by a parameter known as Tobin's Q, which is the ratio of the market value of current capital to the cost of replacement capital. In the case stock prices are low, the value of the firm relative to the replacement cost of its stock of capital (Tobin's Q) is also low (between 0 and 1); implying that the stock is undervalued. Consequently, this leads to a reduction in investment expenditure, and in turn to lower aggregate economic output, as firms find it harder to finance investment expenditures. This occurs because investment would be more difficult, as it would require a higher share offering in a situation of a low share price (Duca, 2007).

The second channel through which stock market performance can affect economic growth is suggested by the traditional valuation model of stock prices. The

[6] The stock market usually starts to decline before the economy as a whole declines.

model suggests that stock prices reflect expectations about the future of the economy, and can, thus predict the economy. According to this model, the stock market is forward-looking, and current prices reflect the future earnings potential, or profitability, of companies. Since stock prices reflect anticipations about profitability, and profitability is directly linked to the behaviour of the economic activity, fluctuations in stock prices are assumed to lead the direction of the economy. If investors anticipate the economy to enter into a recession, then expected profits will consequently be diminished, and stock prices will decrease in value. If they are somewhat successful in their expectations,[7] stock price movements will lead the direction of the economy (Comincioli, 1996).

The third theoretical argument for the reason stock prices may influence the economy is the wealth effect from fluctuations in stock prices. The wealth effect is also presumed as support for the stock market's predictive ability. D. K. Pearce (1983) argues that, since volatility in stock prices has a direct effect on aggregate spending, the economy can be anticipated from the stock market. If share prices are decreasing, investors are less wealthy and spend less, which in turn lowers aggregate consumption. Since consumption is a large part of the economy, this results in slower economic growth.

The fourth possibility through which stock prices impact output is referred to as 'the financial accelerator' (Bernanke & Gertler, 1989; Kiyotaki & Moore, 1997). This channel focuses on the effects of stock prices on firms' balance sheets. Due to the

[7] Several models attempt to explicate the manner in which expectations are formed (Bondt & Thaler, 1985; D. W. Pearce, 1983). These models include the adaptive expectations model and the rational expectations model.

existence of asymmetric information in credit markets, a firm's ability to borrow depends substantially on the collateral they can pledge. The financial imperfections may introduce inefficiencies into financial markets that amplify economic downturns. It is typically the case that borrowing must be secured, since firms are unable to commit to repay their loans. A shock to the economy that lowers the value of some assets used as collateral then makes external financing harder to obtain. This in turn reduces economic activity, and in turn reduces asset prices even further (Elul, 2008).[8]

In line with the theoretical perspective, several empirical studies also reveal that stock market prices can be utilised to predict growth. For instance, Adjasi and Biekpe (2006) in Africa; Deb and Mukherjee (2008) in India; Foresti (2006) in the US; Kaplan (2008) in Turkey; and Mun, Siong, and Thing (2008) in Malaysia, among others.

At the same time, the US and EU have adopted the policy of quantitative easing over the past couple of years in order to solve economic problems. The US desires to boost employment, while the EU has had a hard time since the eruption of the debt crisis, and thus has adopted a loose monetary policy to promote economic growth and solve social contradictions. Instead of resolving the national deficit via fiscal cliff,[9] the debt burden was financed through debt monetisation through massive money supply printing,[10] which caused inflation (lagging indicator) as well as increased prices of

[8] The collateral value firms can offer decreases in scenarios where their stock price value decreases. As the collateral they can offer decreases, lower credit can be offered, which in turn decrease the investment and thereby triggers a contraction in economic activity (Duca, 2007).
[9] The fiscal cliff is a simultaneous spending cuts and tax increases.
[10] The real-business-cycle theory (Kydland & Prescott, 1982; Long & Plosser, 1983) assigns a causal role to real economic activity in influencing the money supply (i.e., changes in output cause changes in money, and not vice versa). In the real business-cycle-theory, the output is determined by real shocks, not by money (Cuddington, 1981; King & Plosser, 1984).

dollar – priced international commodities.[11] Since some of the money has flowed out of the US and EU for international trade, in which other countries have exported goods to the US and EU, and have imported US and European currencies to their countries; this has shifted their debt burden onto other countries, including emerging countries. The money may pour into emerging economies, hit their financial systems, cause exchange rate fluctuations, and increase the risk of financial regulation.

Moreover, several countries such as Australia, India, Turkey, Denmark, Israel, Poland, Mexico, Kenya and South Korea have cut interest rates, while Japan has expanded its credit in order to stimulate the economy. China, on the other hand, has recently cut its corporate tax rate and increased infrastructure spending. Therefore, for all of these reasons, the author believes that inflation is predicted to rise, providing an opportunity to invest in gold.

Figures 1.3(a)-1.3(c) illustrate the trend of money supply in most developed markets (the US, the UK, the Euro area and Japan), BRICs and the Association of Southeast Asian Nations (henceforth ASEAN). The figures clearly demonstrate that the money supply around the world is in a rapidly increasing trend, particularly during the crisis in 2008.

[11] The negative relationship between inflation and real economic activity is based on shifts in the Phillips curve (Phillips, 1958), which shows a negative link between a measure of real economic activity, such as the rate of growth of real output or unemployment, and a nominal value, such as the inflation rate.

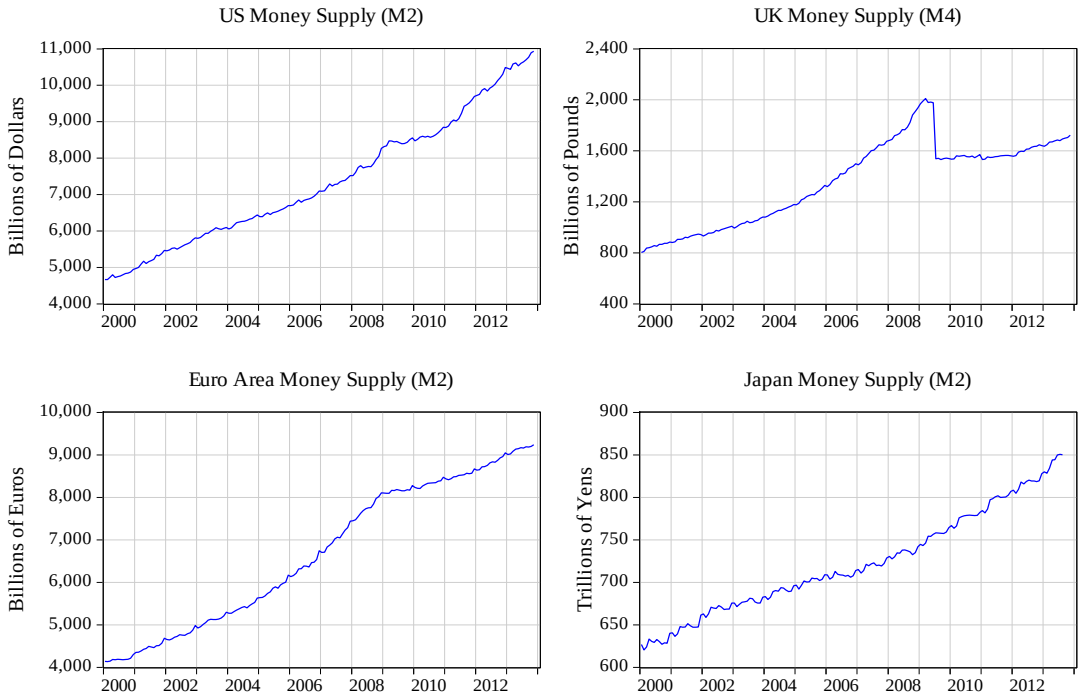

Figure 1.3(a): Trend of Money Supply in Developed Markets from 2000 to 2013 (Monthly Data).
Notes: Money supply data for the US, the UK and the Euro area is from January, 2000 to November, 2013; while data for Japan is from January, 2000 to August, 2013.
Source: International Financial Statistics (IFS henceforth).

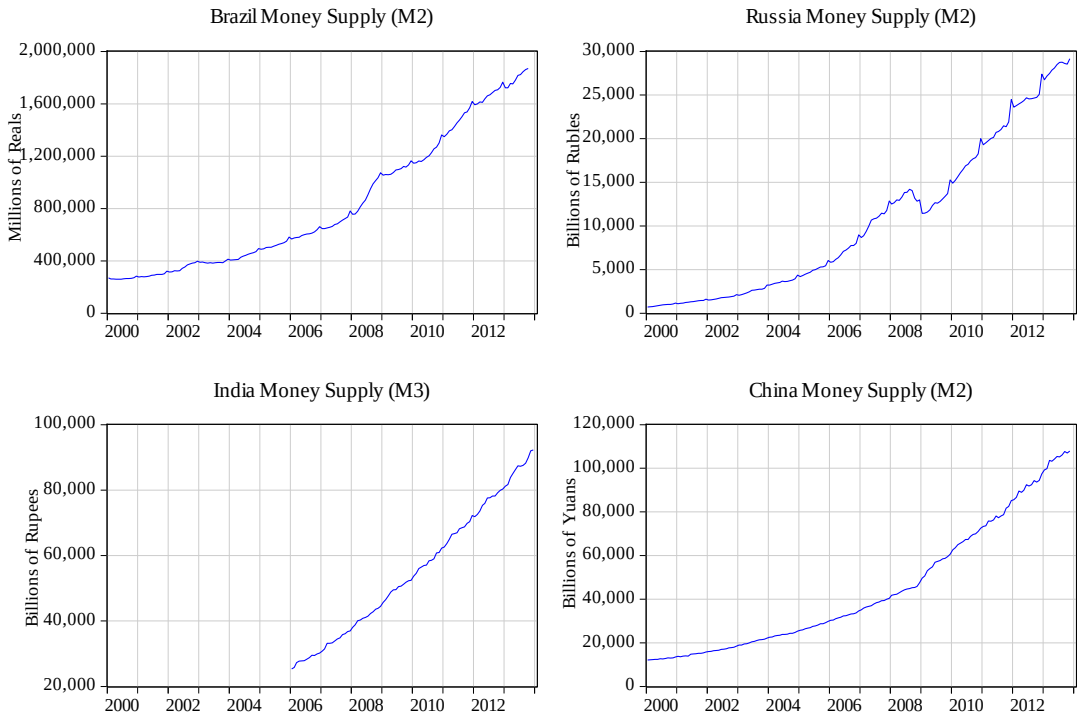

Figure 1.3(b): Trend of Money Supply in BRICs (Monthly Data).
Notes: Money supply data for China and Russia is from January, 2000 to November, 2013; Brazil is from January, 2000 to October, 2013; and India is from January, 2006 to December, 2013.
Source: IFS.

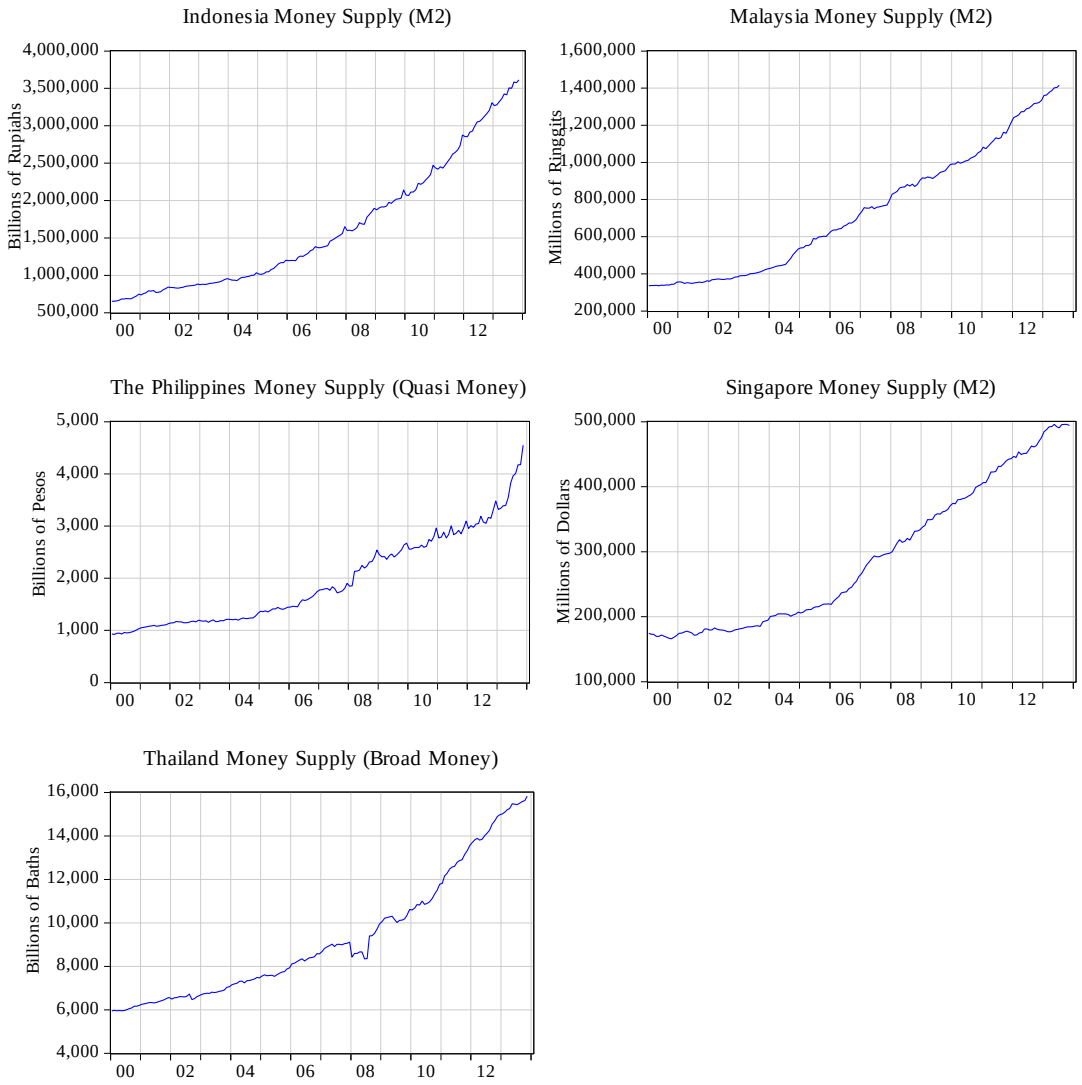

Figure 1.3(c): Trend of Money Supply in ASEAN from 2000 to 2013 (Monthly Data).
Notes: Money supply data for Indonesia, the Philippines, Singapore and Thailand is from January, 2000 to November, 2013; while data for Malaysia is from January, 2000 to July, 2013.
Source: IFS.

In Malaysia, although inflation is historically and relatively low, investors have a good reason to worry that the flat wages, the frequent rise in fuel prices,[12] the impact of goods and services tax (henceforth GST) and the low interest rates that would cause the extensive creation of bank deposits, could potentially lead to inflation in the

[12] From October, 2001 to March, 2015, prices of Ron 97 and diesel in Malaysia have increased by 73% and 178%, respectively; while Ron 95 has increased by 11% from May, 2009 to March, 2015.

future.[13] The corrosive effects of inflation may reduce purchasing power, consumer spending, real interest rates, and the value of savings, which might affect several economic sectors, including property, banking and construction materials. Thus, with this inflationary background, it is perhaps not surprising that the demand for gold is rising, and becomes an alternative and popular solution to investors, including the demand for unlicensed gold trading schemes.[14] This preference creates an opportunity for private companies and financial institutions to offer gold or gold-related products as one of their selling points. On the other hand, a limited supply also helps to drive prices upwards.

Furthermore, the recurring heightened volatility in stock markets is usually viewed to impose a substantial risk to stock investments, particularly during the last ten years. Existing studies on stock market risk have focused on whether the risk can be diversified through global diversification (Phylaktis & Ravazzolo, 2005; Yildirim & Masih, 2014). Nevertheless, tightly correlated international equity markets have led investors to question whether the investment in global equity portfolios can be protected from severe losses due to market volatility. Furthermore, their interactions are more intense during crisis episodes, even where macroeconomic fundamentals would not suggest strong interdependence, and in turn limit the benefits of

[13] Ghazali, Amin, and Muhammad (2008); Ghazali, Kogid, and Amin (2011); Masih and Masih (1998); and Tang (2004); find evidence of a unidirectional link from money supply to inflation in Malaysia without significant feedback, thus supporting the view of the quantity theory of money (Friedman, 1956).

[14] Until May, 2015, based on information and queries received, the Central Bank of Malaysia has released a list of 221 illegal investment companies and websites that are neither authorised, nor have obtained the permission of the Controller of Foreign Exchange, under the Exchange Control Act, 1953 (ECA). Out of 221 illegal investment companies, 50 companies are illegal gold investment companies. Some of these companies are suspected of running Ponzi schemes (i.e., investment scams in which some early investors are paid off with money put up by new investors in order to encourage more and larger risks), taking deposit illegally, money laundering and tax evasion. Source: Central Bank of Malaysia.

diversification (Arshanapalli & Doukas, 1993; Dornbusch, Park, & Claessens, 2000; Forbes & Rigobon, 2002; Lee & Kim, 1993; Meric & Meric, 1997).

Thus, the recent and continuing financial crisis, ongoing inflation and the strength of the price of gold, present a strong motivation to empirically test the ability of gold as a diversifier, a hedge or a safe haven from losses during times of financial and economic turmoil. This is because gold is said to be uncorrelated with other types of assets which are an essential feature in the era of globalisation in which correlations increase dramatically among most asset types. Furthermore, to date, the work that addresses these issues suffers from shortcomings[15] mainly attributable to the responsiveness of the financial market, and therefore offers a scope for potential improvement.

1.3 Gold in the Monetary System

In the nineteenth century, the gold standard, a system in which almost all nations fixed the value of their domestic currencies in terms of a specified amount of gold, was the monetary system that predominated in the developed world. The countries joined the gold standard in part, at least, because "it was a badge of honour and decency", quoting Joseph Schumpeter's words on the reasons behind Austria's decision to link her currency to gold (Capie et al., 2005). At the country level, the gold standard has been

[15] There are relatively few academic studies on the gold market, especially compared with the spate of academic research that has been published on equity, bond and currency markets. Perhaps the most frequently studied area is the role and weighting of gold in a portfolio (see Table 2.1(a)). The first statistical test of when gold serves as a safe haven, and as a hedge, is only explicitly examined in 2010 by Baur and Lucey using data from the US, the UK and Germany. Baur and McDermott (2010) further expanded the analysis by considering several other countries (see Table 2.1(b) and 2.1(c)). There is a long and specific research tradition investigating gold as an inflation hedge (see Tables 2.1(d) and 2.1(e)), but none of prior study examine the safe haven characteristic of gold during varying degrees of inflation. Therefore, although there is a rapidly growing body of research on the economics and financial aspects of the gold market, only a small scale of research has been carried out compared to work on equities, bonds and currency markets (Lucey, 2011).

credited for an extended period of price stability which was supportive of economic growth. At the international level, the gold standard ushered in an era of remarkable capital flows, contributing to global trade, growth and significant economic development. Nonetheless, strict adherence to the gold standard has also been associated with exacerbating the Great Depression, by contributing to extreme deflationary pressures in a time of significant economic downturn, when expansionary monetary policies may have been more appropriate.[16]

Thirty years following the outbreak of World War I, the gold standard gradually crumbled in the face of unrelenting economic, political, and social forces. Some countries held on until 1936, but Britain, the standard's predominant member before 1914, left it in 1931, followed by the US in 1933.

In July, 1944, a total of 730 delegates from 44 Allied Nations have discussed the newly design international monetary system, and how to regulate international trade and finance after the end of World War II. The delegates came to consensus and signed the Bretton Woods Agreement, where all countries would peg their currencies to the US dollar, and the dollar would be redeemable in gold at the standard rate of US$ 35 per ounce.[17] The Bretton Woods System was also a period of relative stability and strong economic growth (Tai & Choo, 2012).

The system functioned well until the late 1960s, during which the US joined the South Vietnamese in the Vietnam War, where the war had cost the US a total of US$

[16] Source: World Gold Council.
[17] The objective of the agreement was to execute a new international exchange system based on the gold exchange standard. During that time 1 ounce of gold equal to 31.10348 grammes.

111 billion. The war has resulted in a balance of payments deficit by the US, constantly out-of-balance domestic budget, a rise in the outflow of money to finance the war and a global concern about the soundness of the dollar. These concerns have led to the belief that the US would soon have to stop selling gold to all buyers at US$ 35 an ounce, and raise the price. The possibility of a price increase touched-off the worldwide run on gold. Countries that have an increasing amount of US dollars began to convert them into gold (Law, 2010).

The problem came to the fore in 1965, when the president of France started to cash in US dollars for gold. France announced its withdrawal from the London Gold Pool,[18] moving large amounts of gold from New York to Paris, and continued its redemption of US dollars for gold. To save the London Gold Pool, participating central banks sold their gold so that the price of gold could remain at the original rate of US $35 per ounce. In the meantime, Switzerland had converted US$ 50 million into gold. This was followed by the attack on the British pound, and a run for gold forced the devaluation of the UK pound by 14.3% on 18th November, 1967, which was one of the final triggers for the breakdown of the pooling arrangement. Finally, more than 50% of gold left Fort Knox for other countries.

Overwhelmed by the situation, on 15th August, 1971, President Nixon, unilaterally without consultation with international leaders, suspended the direct convertibility of the US dollar into gold, which resulted in the Nixon Shock. The rule of money has changed, where a new financial standard known as the dollar standard

[18] London Gold Pool is the pooling of gold reserves by a group of eight central banks in the US and seven European countries that agree to cooperate in maintaining the Bretton Woods System by interventions in the London gold market (Douglas, 2008).

began to emerge, in which the US dollar was no longer backed by gold, and thus became a fiat currency. Since all currencies were pegged with the US dollar, they became free floating instantly, and entirely fiat. Since then, the US government can create an unlimited amount of the US dollars, which further devalues the dollar. This enables them to finance enormous trade and budget deficits with money that has not backed by anything tangible; this eventually resulted in booms and busts in the economies of its trading partners. Despite the official dissolution of the system in April, 1978, the relationship between gold and the US dollar remains to date. The US dollar is among the fundamental determinant factors of the price of gold (Tai & Choo, 2012).

Since the end of the gold exchange standard, the international monetary system progressed through no official international cooperative monetary system, and gold was freely traded in the global market. While gold no longer plays an official role in the international monetary system, it remains a cornerstone reserve asset that accounts for 13% of total official reserves. Furthermore, gold plays an increasing role among private investors, in part supported by the ease of ownership through exchange-traded funds (henceforth ETFs). Private investment is also supported by the growing demand of emerging markets, particularly China and India. Gold's lack of credit or counterparty risk, coupled with the deterioration of sovereign credit, encourages investors and global exchanges to increase the use of gold as a source of high-quality collateral.[19]

[19] Source: World Gold Council.

1.4 The Performance and Characteristics of Gold as a Financial Asset

> *"Gold is a way of going long on fear, and it has been a pretty good way of going long on fear from time to time. But you really have to hope people become more afraid in a year or two years than they are now. And if they become more afraid you make money, they become less afraid you lose money, but the gold itself doesn't produce anything"* (Buffet as cited in Cline, 2015, p. 203).

Gold is an asset that is both in tangible and liquid (that is easily traded) form, unlike real estate, which is tangible but illiquid, or company stocks and bonds, which are liquid but not tangible.[20] Gold has been used as a medium of exchange for thousands of years, and it is considered wealth "at all times and all places" (Petty, 1690). Willem Buiter, a former professor at the London School of Economics, believes that gold is "the longest-lasting bubble in human history". He would not invest more than a sliver of his wealth "into something without intrinsic value, something whose positive value is based on nothing more than a set of self-confirming beliefs" (Economist, 2010).

Traditionally, gold is used as a store of value, and as a hedge against the falling dollar.[21] Furthermore, gold is unique in that it does not carry credit risk, liquidity risk or market risk. Credit risk is that in which a debtor is unable to repay a loan. Investing in gold will avoid the risk that a coupon or a redemption payment will not be made, as for a bond and chance that a company will go out of business, as with equity. Liquidity

[20] Source: Pacific Index International Limited.
[21] Gold has characteristics of money and money is not currency since money has a store of value due to limited in quantity.

risk is that in which an asset cannot be sold in the case a buyer in the market may not be available at the time of reselling. Gold benefits from demand among a broad range of buyers and a wide range of investment channels, including bars and coins, jewellery, futures and options, ETFs, certificates and structured products. The worldwide markets trade gold 24 hours a day. The gold market is liquid and deep, as shown by the fact that this asset can be traded at narrower spreads, and more rapidly than most diversifiers, or even mainstream investments. Moreover, gold is the most liquid asset at times of financial turmoil and political uncertainty, and consequently, investors are willing to pay a premium price for it (Jaffe, 1989). Market risk, on the other hand, is that in which prices will fall due to a change in market conditions. Albeit gold is subject to market risk, it tends to have a low correlation to most assets typically held by institutional and individual investors, which significantly enhances its attractiveness as a portfolio diversifier. Volatility is a strong indicator of market risk that measures the dispersion or variation of returns for a given security or market index. Normally, the greater the volatility of an asset, the riskier it is. The price of gold is typically less volatile than other commodity prices due to the liquidity and depth of the gold market, which is supported by the availability of large above-ground stocks of gold. Much of it is in near market form, meaning that a sudden excess in demand for gold can usually be satisfied with relative ease (Artigas, Ong, Palmberg, Street, & Grubb, 2010).

The appetite for gold arises partly from the paltry, uncertain returns from more conventional investments. The main drawback of gold is that it pays neither a dividend (e.g., a share), nor a coupon (e.g., a bond) or rent (e.g., property). Nevertheless, the monetary policy has maintained official rates of interest, and thus the opportunity cost

of holding gold, low and seems set to do so for a while. The government bond yields[22] presumed as safest, notably America's and Germany's, are also thin. Stock markets are weighed down by worries about economic growth. Investing in property, which lies at the root of the financial crisis, requires boldness that many lack. Since gold is an investment that does not generate income, its appeal lies solely in the hope that its value will rise, or will at least be maintained (Economist, 2010).

Similar to other goods, the price of gold is determined by demand and supply. The demand for gold is roughly classified into four categories: (1) the demand for jewellery purposes, where the key markets are India, China and the US;[23] (2) the demand for technological and production use, where many use it for applications in many different industries, for instance, gold is applied to the health (e.g., dentistry), electronics, and chemical industries; changes in real economic and business activities affect industrial demands (Adrangi et al., 2003); (3) official sector purchases, where central banks hold gold as a store of value; occasionally, central banks are known to engage in buying and selling gold (Burns, 1997); and finally, (4) the demand for investment, which can be divided into the demand for gold bars and gold coins. It is used by governments, fund managers, and individuals as an investment asset (Ghosh et al., 2004).[24] Jewellery and technology use demand tend to follow the business cycle, where it is largely determined by consumer spending power (Baur & McDermott, 2010). Concerning the fourth demand type, ETFs that index gold prices facilitate gold

[22] Although government bonds do not default nearly as often as corporate bonds, since governments control the monetary policy, it will cause inflation and a degradation of the value of paper money (default by another name).

[23] India is the largest market for gold jewellery in the world due to a cultural and religious tradition independent of the economic variable, where it represented 746 tonnes of gold in 2010. China is the fastest-growing market for gold jewellery, accounting for 400 tonnes of demand. The US accounted for 129 tonnes of gold in jewellery, making it one of the world's most significant consumer markets. Source: World Gold Council.

[24] Gold also plays a role in religious customs, reward systems and ornaments.

investments for several years. As a consequence, the investment demand for gold exceeded the demand for jewellery in 2009, where it accounts for a third of the world's gold demand.[25] This demonstrates that the demand for gold from investors is counter-cycle; to wit, this demand is rising as the global economy enters a recession (Baur & McDermott, 2010).[26]

As for the supply-side factors, gold is supplied by mining production, net producer hedging and recycled gold.[27] The overall supply in 2012 was composed of 64% in mining and 36.5% in recycled products[28]. The unique characteristics of the gold market, similar that of other commodities, is relatively inelastic in supply. This is in part due to the difficulty associated with extracting gold from the ground and the long lead-in times between the establishment of a new mine and commencement of commercial production (according to the World Gold Council, this process can take up to five years).

1.5 The Two Main Issues

This study investigates two main issues. The first issue deals with gold as a diversifier, a hedge and a safe haven against stock. It then goes on to the investigation of gold as a hedge and as a safe haven against inflation.

[25] In the period of 2002-2012, jewellery demand has declined from 2662 tonnes to 1908.1 tonnes; a decrease of 28.32%. On the other hand, gold investment demand has grown from 352 tonnes in 2002 to 1534.6 tonnes in 2012; an increase of 336% (Street, Palmberg, Artigas, & Grubb, 2013).

[26] After 1975, when the US allowed its citizens to own non-jewellery gold, the price of gold changed drastically. First, it increased up to US$ 850 per ounce in 1980 (inflation-adjusted price is US$ 2337), and then it steadily declined for two decades to US$ 250 per ounce (on 20th July, 1999) (Smyth & Zarembski, 2006). In 2011, the gold price exceeded US$ 1800, which is a rise of 26% compared to 2010. Source: World Gold Council.

[27] In the period of 2002-2012, the gold supply has grown from 3557 tonnes to 4453 tonnes; an increase of only 25.2%.

[28] Recycled gold is gold sourced from old fabricated products that have been recovered and refined into bars.

1.5.1 Gold as a Diversifier, a Hedge or a Safe Haven against Stock

Generally, in a group of similar assets, assets will react correspondingly among each other during the transformation of the economy and financial system. Besides the common investment drivers such as company shares, bonds and mutual funds, gold investment is an option for investors to diversify their investment portfolio. Therefore, a significant and growing body of literature investigates the role of gold in portfolio allocation (Chua et al., 1990; Hillier et al., 2006; Jaffe, 1989; Sherman, 1982). Due to the for centuries, gold is alleged to be important in providing valuable diversifying qualities beyond those achievable in a portfolio devoted solely to financial assets.

Due to its unique nature, gold has always been regarded as a safe asset. A drastic shift in recent years towards investment demand from jewellery demand reflects the concept that gold can be considered a safe haven asset in times of economic turmoil, since investors construct their portfolios to include more gold as an alternative to riskier assets. During financial distress in which stock and bond markets endure a severe downturn, the price of gold normally rises steadily. For example, gold reached an all-time high record of US$ 1896.50 an ounce on 5th September, 2011, mainly due to a poor jobs report, the Euro debt crisis and lingering uncertainty around the US debt ceiling crisis (Amadeo, 2013).[29] The price of gold has demonstrated this pattern in past crises as well (e.g., the last peak in 1980 during another period of economic recession).

In contrast to gold, the stock market is negatively affected by an economic crisis. Despite the development of several tools and techniques to predict stock prices, the stock market is still regarded as the most volatile and unpredictable market for

[29] Source: LBMA.

investment purposes. Investors buy and sell stocks on a frequent basis to earn returns from, and exploit, the fluctuation in stock prices. The stock market has been exceedingly volatile less than a decade ago, particularly during the crisis in 2008, which caused many companies to become bankrupt, and even the big economies of the world could not save themselves. The real panic began in 2008 when the largest US financial institutions such as Fannie Mae, Freddie Mac, Merrill Lynch, Lehman Brothers and American International Group (AIG) were either put up for sale, taken over by the US government, or became bankrupt. The Standard & Poor's 500 (henceforth S&P 500) fell 56.8% from its peak on 9th October, 2007, to a low point on 9th March, 2009.[30] Much of the decline in the US occurs in a brief period. For instance, from its peak of 1,300.68 on 28th August, 2008, the S&P 500 fell 48% in a little over six months, to its low of 676.53 on 9th March, 2009.[31]

Figure 1.4 presents the evolution of the S&P 500, and the price of gold through time, for the 15-year sample period. The figure illustrates that the price of gold and the level of the S&P 500 move in opposite direction during certain periods, particularly during the US recessions (i.e., burst of the dot-com bubble in 2001, and the global financial crisis in 2007-2009) and co-move in others (e.g., from 2004 to 2007). This figure suggests that the relation between gold and the equity portfolio is not constant; i.e., the beta changes over time. Obviously, the periods in which gold and the equity portfolio move in opposite directions are consistent with gold as a hedge against

[30] On 15th October, 2008 the Dow Jones Index recorded its largest one-day fall – losing 8% of its value in a single day's trading – since Black Monday in 1987.

[31] Data of International Monetary Fund (henceforth IMF) illustrated the magnitude of the crisis as mark-to-market losses on mortgage-backed securities, collateralised debt obligations and related assets through March, 2008 were approximately $945 billion. In absolute terms, this represents the largest financial loss in history, exceeding the asset losses that resulted from Japan's banking crisis in the 1990s ($780 billion), and far surpassing losses stemming from the Asian crisis of 1997-1998 ($420 billion), and the US savings and loan crisis of 1986-1995 ($380 billion) (Bartlett, 2008).

changes in the equity portfolio. Gold gains value in the S&P 500 bear markets (from March, 2000-September, 2001; January, 2002-October, 2002; October, 2007-November, 2008; January, 2009-March, 2009) and loses value in the S&P 500 bull markets (from September, 2001-January, 2002; November, 2008-January, 2009; March, 2009-March, 2013).[32] Some periods are not consistent with a hedge, since there is strong co-movement between the two assets (from 2003-2007). In these periods, gold was potentially driven by growth-related factors, especially demand from emerging markets. It is also possible that investors anticipated a crash, and bought gold as a hedge against such an event. After the stock market slump in 2008, gold regained its status as a hedge or a safe haven asset. Figure 1.5 focuses on the period in which gold moves in directions opposite to those of the S&P 500. This pattern is very clear in 2008, when stock markets fell significantly, and gold increased by a similar magnitude. The figure also shows that there is considerable noise in both the stock price index and the price of gold.

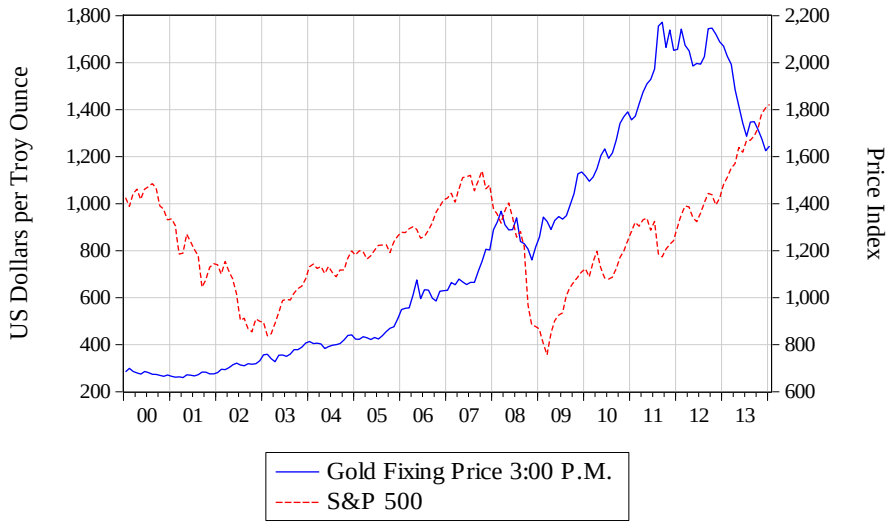

Figure 1.4: The Evolution of Gold Price and S&P 500 over a 15-Year Period from 2000 until 2014 (Monthly Data).
Source: Gold price data comes from the LBMA homepage. The S&P 500 data comes from Economic Research, Federal Reserve Bank of St. Louis homepage.

[32] Source: BofA Merrill Lynch Global Research, Bloomberg.